

THE ROTATIONAL AND GRAVITATIONAL EFFECT OF EARTHQUAKES

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The static displacement field generated by an earthquake has the effect of rearranging the Earth's mass distribution and will consequently cause the Earth's rotation and gravitational field to change. Although the coseismic effect of earthquakes on the Earth's rotation and gravitational field have been modeled in the past, no unambiguous observations of this effect have yet been made. However, the Gravity Recovery And Climate Experiment (GRACE) satellite, which is scheduled to be launched in 2001, will measure time variations of the Earth's gravitational field to high degree and order with unprecedented accuracy. In this presentation, the modeled coseismic effect of earthquakes upon the Earth's gravitational field to degree and order 100 will be computed and compared to the expected accuracy of the GRACE measurements. In addition, the modeled second degree changes, corresponding to changes in the Earth's rotation, will be compared to length-of-day and polar motion excitation observations.